Children's Hospital of Philadelphia PolicyLab

Neighborhood Physical Disorder and Adverse Pregnancy Outcomes Among Women in Chicago: A Cross-sectional Analysis of Electronic Health Record Data

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Adverse pregnancy outcomes increase infants' risk for mortality and future health problems. Neighborhood physical disorder may contribute to adverse pregnancy outcomes by increasing maternal chronic stress. Google Street View technology presents a novel method for assessing neighborhood physical disorder but has not been previously examined in the context of birth outcomes. In this cross-sectional study, trained raters used Google's Street View imagery to virtually audit a randomly sampled block within each Chicago census tract (n = 809) for nine indicators of physical disorder. We used an item-response theory model and spatial interpolation to calculate tract-level neighborhood physical disorder scores across Chicago. We linked these data with geocoded electronic health record data from a large, academic women's hospital in Chicago (2015–2017, n = 14,309 births). We used three-level hierarchical Poisson regression to estimate prevalence ratios for the associations of neighborhood physical disorder with preterm birth (overall and spontaneous), small for gestational age (SGA), and hypertensive disorder of pregnancy (HDP). After adjustment for maternal sociodemographics, multiparity, and season of birth, living in a neighborhood with high physical disorder was associated with higher prevalence of PTB, SGA, and HDP (prevalence ratios and 95% confidence intervals 1.21 (1.06, 1.39) for PTB, 1.13 (1.01, 1.37) for SGA, and 1.23 (1.07, 1.42) for HDP). Adjustment for neighborhood poverty and maternal health conditions (e.g., hypertension, diabetes, asthma, substance use) attenuated associations. Results suggest that an adverse neighborhood physical environment may contribute to adverse pregnancy outcomes. However, future work is needed to disentangle the unique contribution of physical disorder from other characteristics of disadvantaged neighborhoods.

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